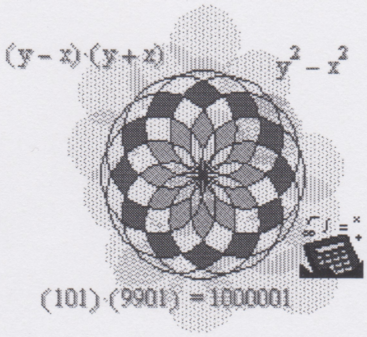
MST121 Chapter A0 Subsection 2.2, file 121A0 - 01

Documents, expressions and text

Welcome to your first MST121 Mathcad document !



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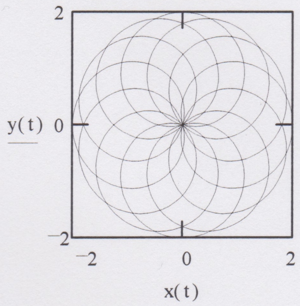
MST121

Introduction

Mathcad turns your computer screen into a mathematical worksheet where you can -

- perform calculations $(101)\cdot(9901) = 1000001$
- manipulate algebraic expressions $(y - x)\cdot(y + x)$ expands to $y^2 - x^2$
- draw graphs $t := 0, 0.01 .. 2\cdot\pi$ $x(t) := \cos(t) + \cos(13\cdot t)$ $y(t) := \sin(t) + \sin(13\cdot t)$
- and do much, much more ... !

We hope that you'll have fun using Mathcad
to explore and solve a wide range of problems.



▶ Please scroll down to see the next page.

Getting around a document

This page describes the document layout and navigation techniques common to all MST121 Mathcad documents. Just how much of this page you can see depends upon the size of your computer screen.

▶ Ensure that the Mathcad window is as large as possible, by clicking on the maximise button in the top right corner of the window, if you have not already done so.

A large (high-resolution) screen may now show additional blank pages off to the right of this one. You can use the **Window** menu and **Zoom** option to magnify your view, to see just one page width. (On some computers zooming can distort the information shown on the page - if you experience any problems with this option, then leave the zoom magnification at its normal value, 100%.)

▨ A document is divided into **pages**, each of which may be longer than the Mathcad window.

To move up and down within a page and bring unseen parts into view, use the **scroll bar** at the right-hand edge of the Mathcad window. You can also use the 'Page Up' [PgUp] and 'Page Down' [PgDn] keys which, contrary to their names, move the red cross cursor only a few lines at a time.

Pages begin with a title and are numbered in their top right-hand corner. Before the number is a keyword which indicates what the page is about - this page contains explanatory text to read.

The end of a page is indicated by a thick line, like this one

At the end of a document you will see END

▨ **Getting around quickly ...**

To navigate through a document you can move to the top of a page.

Press [**Shift**][**PgUp**] to go back up to the top of the current or previous page.

Press [**Shift**][**PgDn**] to go down to the top of the next page.

(Note : you must press and hold down the [Shift] key, and then press [PgUp] or [PgDn].)

To go to the top of a specific page you can alternatively -

(1) Select the **Edit** menu and choose **Go to Page...** from the bottom of the list of commands.

(2) A 'Go to Page' option box will appear.
Either type in the 'Page Number' box or click on the 'First Page' / 'Last Page' buttons.

(3) Finally click on the 'OK' button to go to the required page.

▶ Now try out all of these navigation techniques for yourself. Travel up and down the whole document, but make sure that you end your journey at the top of the next page, that is page **4**.

(The current page number is always shown in the status bar, at the bottom of the window.)

Entering your own expressions - Task 1

When a task requires you to **enter** information in a particular place,
the **pencil** symbol shows you the position on the screen at which to type. **you type here !**

You need to move the mouse arrow a little to the right of the pencil.
Then click to get the **red cross cursor** into the correct position.

(If you click too close to the pencil, a blue box will appear around the pencil.
Don't worry - simply move the mouse arrow a little more to the right and try again.)

Sequences of keystrokes for you to type must be entered exactly, with no spaces in-between.

They are shown in the following style **3*3+4*4-5*5=** (The *, for multiply, is [**Shift**]**8**.)

Task

- Type it for yourself here. If you got the answer **0**, well done !

There are two more expressions to enter below, followed by comments at the bottom of the page.

- Type **1+9*10-30/5=** Answer **85**
- Type **11.9+6.2*4.9=** Answer **42.28**

Comments

- Here are the three expressions.

$$3\cdot 3+4\cdot 4-5\cdot 5=0$$

$$1+9\cdot 10-\frac{30}{5}=85$$

$$11.9+6.2\cdot 4.9=42.28$$

Notice in the last expression how Mathcad displays the multiplication sign and decimal points.

- When entering mathematical expressions use the keys ***** ([**Shift**]**8**) for multiply
  / for divide
  and **.** (the full stop) for a decimal point.

Do not press the spacebar, unless you see the key [**Space**] given in the entry sequence.

- To finish entering an expression you can either move the mouse arrow to a fresh point on the page and click, or press the [↵] key. (This key may also be labelled **Return** or **Enter**.)

Editing expressions - Task 2

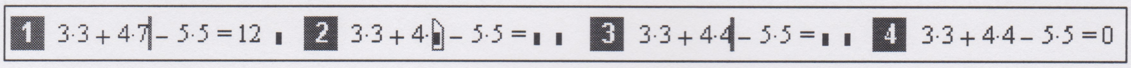
You can **edit** a Mathcad expression to
- correct a typing mistake
- or insert some extra information.

The first step is to click on the expression, to obtain the blue bar editing cursor **|** .
If you get a blue box - keep pressing the 'Down Arrow' key [↓] until the blue bar appears.

You can then use the left and right arrow keys to position the cursor within the expression.

The picture sequence below shows how to change $3\cdot3+4\cdot7-5\cdot5=12$ to $3\cdot3+4\cdot4-5\cdot5=0$

Position the cursor immediately after the 7 (1). Press the [**Backspace**] key to delete the 7 (2), followed by typing **4** (3). Click elsewhere on the page, or press the [↵] key, to complete the edit (4).



1 $3\cdot3+4\cdot7|-5\cdot5=12$ 2 $3\cdot3+4\cdot\blacksquare-5\cdot5=\blacksquare$ 3 $3\cdot3+4\cdot4|-5\cdot5=\blacksquare$ 4 $3\cdot3+4\cdot4-5\cdot5=0$

Task

- Now try editing the expression for real. Change the 7 to a 4. $3\cdot3+4\cdot7-5\cdot5=12$
- Next correct this expression, by getting the blue bar cursor **|** between the two 3's and typing * to insert a multiplication sign. $33+4\cdot4-5\cdot5=24$

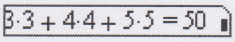
Deleting an entire expression

Editing expressions is not always straightforward.
It is sometimes easier to delete the entire expression, and then re-type it from scratch.

To delete an expression :

(1) Click anywhere on the expression.

(2) If necessary, press the 'Up Arrow' key [↑] repeatedly, until the entire expression is enclosed in a blue box, as shown in this picture -



$3\cdot3+4\cdot4+5\cdot5=50$

(3) Then select the **Edit** menu and **Cut** (or press [**Ctrl**]**x**) to delete it.

- Have a go for yourself.

Delete the expressions below so that only the three pencil symbols remain.
You are not expected to re-type anything in their place !

$1+9\cdot10-\frac{30}{5}=85$ $(101)\cdot(9901)=1000001$ $(y-x)\cdot(y+x)$

Entering your own text - Task 3

Mathcad handles text as easily as it does mathematical expressions, so you can include notes in your documents. Different colours are used to distinguish between text and expressions.

- By default, all **text** appears in **blue** ... this is text !
- While expressions appear in black ... $3 \cdot 3 + 4 \cdot 4 - 5 \cdot 5 = 0$

(There are details of how to set these colours at the bottom of this page.)

If you just start typing, Mathcad thinks that you are entering an expression ... Thisisanexpression!

- In order to **enter text**, read the following instructions, then try the task below.

(1) Move the mouse arrow to where you wish to type, then click to position the red cross cursor.

(2) Select the **Text** menu and choose **Create Text Region**.
You will see a text box, with a red bar cursor inside - like this

(3) Anything you type then appears as text within the box.
It will grow as you type. Pressing the [↵] key gives a new line in the text box.

To **stop** entering text move the mouse arrow to a point outside the text box, and click.

Task

- Enter your own text comment here.

- **Keyboard short cut**

You can also type a double quote **"** (given by [Shift]2) to create a text region.

- **Editing text**

To **edit** a piece of text, simply click on it !
The text box and red bar cursor will reappear, allowing you to insert or delete text as you wish.

To finish editing text, move the mouse arrow to a point outside the text region, and click.

- **Text and expression colours**

By default, Mathcad uses **dark blue** for text ... this is text

and **black** for expressions ... $3 \cdot 3 + 4 \cdot 4 - 5 \cdot 5 = 0$

To set these colours select the **Window** menu and **Change Colors**.

Choose the sub-option **Text Color...** or **Equation Color...** to bring up a dialog box containing an artist's palette of different colours. Click on the colour you desire; then click on the 'OK' button.

- Now have a break, or move on to Activity 2.10 and file 121A0-02.

Please refer back to **Chapter A0 Starting points** if you want to finish this computer session and need a reminder of how to exit from Mathcad.

END